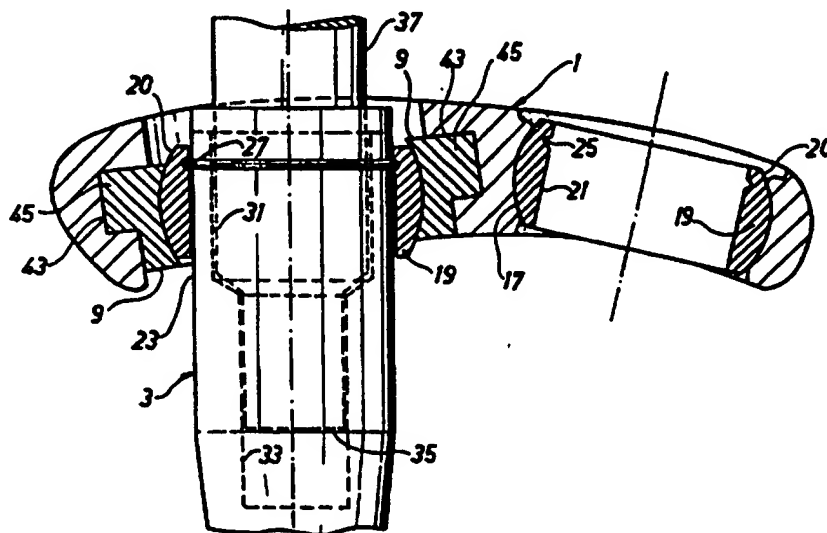




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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|--|--|--|
| (51) International Patent Classification 6 :<br><b>A61B 17/86</b>  |  | (11) International Publication Number: <b>WO 95/35067</b>  |
| <b>A3</b>  |  | (43) International Publication Date: 28 December 1995 (28.12.95)   |
| (21) International Application Number: PCT/SE95/00744<br>(22) International Filing Date: 16 June 1995 (16.06.95)<br>(30) Priority Data:<br>9402130-0 17 June 1994 (17.06.94) SE<br>(71)(72) Applicant and Inventor: OLERUD, Sven [SE/SE]; Villa<br>Malmen, S-740 11 Lanna (SE).<br>(74) Agent: AWAPATENT AB; P.O. Box 45086, S-104 30<br>Stockholm (SE). |  | (81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH,<br>CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE,<br>KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN,<br>MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK,<br>TJ, TM, TT, UA, UG, US, UZ, VN, European patent (AT,<br>BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL,<br>PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN,<br>ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD,<br>SZ, UG).<br><br><b>Published</b><br><i>With international search report.</i><br><i>Before the expiration of the time limit for amending the</i><br><i>claims and to be republished in the event of the receipt of</i><br><i>amendments.</i><br><i>In English translation (filed in Swedish).</i><br><br>(88) Date of publication of the international search report:<br>8 February 1996 (08.02.96) |

(54) Title: A BONE SCREW FOR OSTEOSYNTHESIS



## (57) Abstract

An implant device comprises a plate element (1) with a number of bone screw holes and bone screws (3) which are insertable and lockable therein. The head portion (23) of a bone screw is adapted to be inserted in an annular hole insert (19) mounted in the associated hole, such that the bone screw (3) can be made to occupy different angular positions in relation to the plate element by rotating or tilting the hole insert (19) and the bone screw therein in relation to the hole wall (17). The head portion (23) of a bone screw is adapted, when is unlocked state, to be retainable in the hole insert (19) in such a manner as to be nondisplaceable in the longitudinal direction but preferably be rotatable, owing to the fact that it is provided with an annular bead (27) while the cooperating inner annular surface (21) of the hole insert is formed with an annular recess (25) matching and receiving the annular bead. A bone screw hole located at one plate-element end is adapted to be displaceable as a result of being provided in a plate member (9), which is so mounted in the plate element (1) as to be translationally displaceable.

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 95/00744

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A61B 17/86

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|-----------|---|-----------------------|
| X         | DE 3027148 C2 (INSTITUT STRAUMANN AG), 27 May 1982 (27.05.82), column 7, line 14 - column 8, line 16, figure 13           | 1,8                   |
| A         | --  | 2                     |
| X         | CA 1329525 C (SYNTHES), 17 May 1994 (17.05.94), figure 6, page 7, second paragraph  | 1,8                   |
| A         | --  | 2                     |
| A         | WO 8803781 A1 (RAVEH, JORAM), 2 June 1988 (02.06.88), figures 14,20,21, page 8, third paragraph, page 13, third paragraph | 1                     |
|           | -----   |                       |

☐

Further documents are listed in the continuation of Box C.

☒

See patent family annex.

## \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
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- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

5 January 1996

Date of mailing of the international search report

11-01-1996

Name and mailing address of the ISA/  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. +46 8 666 02 86

Authorized officer

Anette Hall  
Telephone No. +46 8 782 25 00

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE95/00744

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See the attached sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-2, 8

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (1)) (July 1992)

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/SE95/00744

1. Claims 1-2, 8: A securing arrangement for a bone screw.
2. Claims 3-7: A bone plate with holes for screw.

According to Rule 13(1) PCT, an international application shall relate to one invention or to a group of inventions so linked as to form a single inventive concept.

**Claim 3:**

In spite of the formal relationship present between independent-dependent claims the subject defined by the problems and their means of solution, do not present a single general inventive concept.

The formal relationship is also unacceptable with regard to rule 13(4) PCT, prescribing that dependent claims should relate to specific forms of the invention claimed in an independent claim.

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

11/12/95

International application No.

PCT/SE 95/00744

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)   | Publication<br>date                          |
|---|---------------------|--|--|
| DE-C2- 3027148                            | 27/05/82            | CH-A- 645264<br>US-A- 4388921                                      | 28/09/84<br>21/06/83                         |
| CA-C- 1329525                             | 17/05/94            | NONE   |  |
| WO-A1- 8803781                            | 02/06/88            | CH-A,B- 672245<br>EP-A- 0293411<br>JP-T- 2500490<br>CH-A,B- 669105 | 15/11/89<br>07/12/88<br>22/02/90<br>28/02/89 |

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